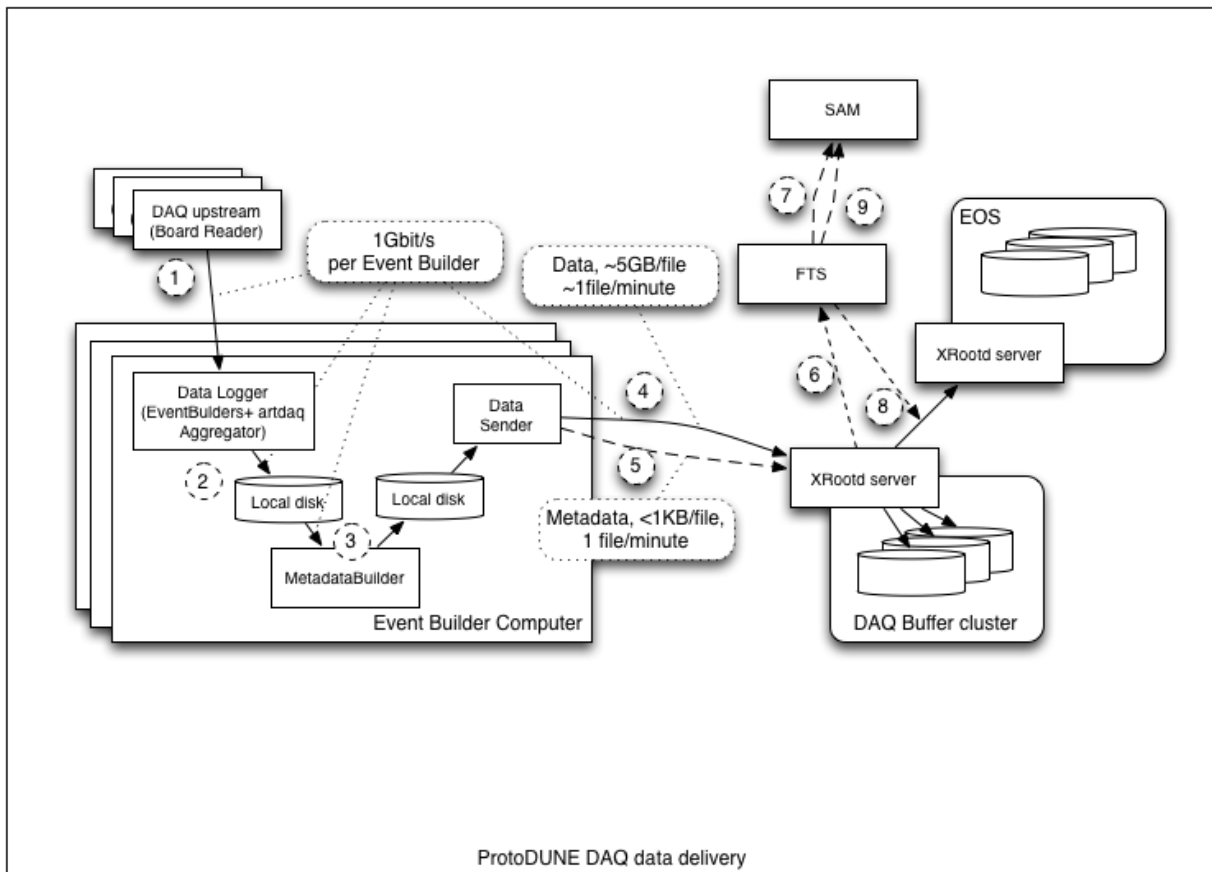


# ProtoDUNE DAQ Data Delivery Proposal

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1. Event Builder received data from the upstream DAQ
2. artdaq Aggregator writes the data to temporary location on the local disk at ~1Gbit/s rate and moves it to output location when the file is closed
3. Metadata Builder detects new data file in the output location, reads it and creates the metadata file, which includes the checksum calculated over the data file along with information needed to be sent to SAM. The metadata file initially is written into a temporary location and then moved to the output location.
4. Data Sender detects new metadata file in the output location and finds corresponding data tile in the output location. Presumably, data file name can be

derived from the metadata file name.

4.1. Data Sender sends the data file to the DAQ Buffer cluster over XRootd.

5. If the data file transfer was successful, Data Sender sends the corresponding metadata file to the DAQ Buffer cluster
  - 5.1. If the transfer was successful, it deletes both data and metadata files from the local output location.
6. FTS detects new metadata file in the DAQ Buffer cluster by periodic polling for files with certain name pattern at the specified location using “xrootdfs ls” command.
7. FTS reads the metadata file and creates an entry in SAM and sends the metadata to SAM. It notifies SAM that the file is at the “DAQ Buffer” location.
8. FTS initiates the transfer of the data file from DAQ Buffer to EOS using xrootd and
9. If the transfer to EOS was successful, FTS:
  - 9.1. Adds EOS as the new location for the file in SAM replica catalog
  - 9.2. deletes both data and metadata files from DAQ Buffer
  - 9.3. Removes DAQ Buffer from the file location list in the replica catalog

## Risks

The data file size is from 1 to 5GB. We have freedom to choose the file.

Data file is written by the Aggregator at ~1Gbit/sec rate. Then the file has to be read twice: by the Metadata Builder and then by the Data Sender. So the local disk needs to sustain 1Gbit/sec writing and 2Gbit/sec reading in average. It may be beneficial to use SSD for the local disk.